

CLAIMS

1. (Currently Amended) A material separation screen, comprising:

multiple elongated screen members aligned along a separation screen frame that rotate in a direction causing material to move along the material separation screen, the multiple elongated screen members having a shape and spacing so that substantially rigid materials ~~move along~~ are carried over a top portion of the material separation screen while non-rigid or semi-rigid material slide down between adjacent ones of the multiple elongated screen members [,];

at least one vacuum member co-linearly aligned with the elongated screen members wherein the ~~multiple elongated members are tubes with a continuous round cross-sectional shape with a substantially smooth outside surface that extends along substantially an entire length of the elongated members~~ vacuum member includes a hollow elongated stationary tube having holes;

a divider that inserts into the elongated tube and forms a first chamber that maintains constant alignment with a same first set of the holes in the tube while the material is carried over the material separation screen; and

a vacuum attached to the first chamber formed in the elongated tube by the divider, the vacuum generating a constant negative air flow through the first set of holes sucking the non-rigid or semi-rigid material down between the vacuum member and an adjacent co-linear elongated screen member while the substantially rigid materials continue to be carried over the top portion of the material separation screen.

2. (Cancelled).

3. (Currently Amended) The material separation screen according to claim 1 ~~including at least one vacuum member that includes input holes that suck air for retaining some of the non-rigid materials~~ wherein the divider forms a second chamber in the tube below the first chamber that maintains constant alignment with a second same set of the holes in the tube that are located below the first set of holes, the vacuum attached to the second chamber and generating a positive air flow that blows air out through the second set of holes.

4. (Currently Amended) The material separation screen according to claim 3 ~~1~~ wherein the ~~vacuum member includes output holes that blow air for dislodging the non-rigid materials retained by the input holes~~ divider includes multiple fins that extend radially out from a center hub.

5. (Currently Amended) The material separation screen according to claim 4 ~~including a divider located inside the vacuum member that separates the input holes from the output holes~~ wherein the divider is sized to provide a relatively tight rigid abutment against an inside wall of the tube.

6. (Currently Amended) The material separation screen according to claim 1 including discs located on at least some of the multiple elongated screen members.

7. (Currently Amended) The material separation screen according to claim 6 wherein the discs have multiple sides that maintain a substantially constant spacing with discs on adjacent multiple elongated screen members.

8. (Previously Presented) The material separation screen according to claim 6 wherein at least some of the discs are dual diameter discs having a primary disc with a first outside perimeter and a second disc with a second outside perimeter smaller than the first outside perimeter.

9. (Currently Amended) The material separation screen according to claim 8 wherein the primary disc on a first one of the multiple elongated screen members is aligned with the secondary disc on a second adjacent one of the multiple elongated screen members and the secondary disc on the first one of the multiple elongated screen members is aligned with the primary disc on the second adjacent one of the multiple elongated screen members.

10. (Previously Presented) The material separation screen according to claim 9 wherein the dual diameter discs on adjacent elongated members partially overlap.

11. (Cancelled).
12. (Cancelled).
13. (Cancelled).
14. (Cancelled).
15. (Cancelled).
16. (Cancelled).
17. (Cancelled).
18. (Cancelled).
19. (Cancelled).

20. (Currently Amended) A material separation screen, comprising:

multiple elongated ~~tubes~~ screen members aligned along a same plane on a separation screen frame that rotate ~~in a direction~~ causing material to move along a top portion of the material separation screen, the multiple elongated ~~tubes~~ screen members having a shape and spacing so that substantially rigid materials move along the screen while non-rigid or semi-rigid material tend to slide down between adjacent ones of the multiple elongated screen members; and

at least one of the ~~multiple elongated tubes~~ being a vacuum tube that includes input is located along the same plane on the separation screen frame in-line and in-between the elongated screen members, the vacuum tube including a first set of holes that ~~suck air~~ include holes aligned substantially upward from a top side of the vacuum tube and also include holes that are aligned laterally outward from a side of the vacuum tube toward an adjacent in-line screen member on the separation screen frame; and

a vacuum coupled to the vacuum tube that sucks air through the first set of holes pulling smaller, flexible fiber, or de-inking material moving along the top portion of the material separation screen for retaining some of the non-rigid materials downward between the vacuum tube and the adjacent in-line screen member while other larger and substantially more rigid materials continue to move along the top portion of the material separation screen.

21. (Currently Amended) The material separation screen according to claim 20 wherein the vacuum tube includes ~~output holes that block air for dislodging the non-rigid materials retained by the input holes~~ a second set of holes aligned substantially downward from a bottom side of the vacuum tube, the vacuum blowing air through the second set of holes promoting the movement of the smaller, flexible fiber, or de-inking material downward and away from the vacuum tube and the elongated screen members.

22. (Currently Amended) The material separation screen according to claim ~~21~~ 20 including a divider extending ~~substantially along an entire~~ inside ~~length~~ of the vacuum tube and sized to provide a relatively tight rigid abutment against an inside wall of the vacuum tube, the divider that separates the input holes from the output forming a chamber inside the vacuum tube that is aligned with the first set of holes.

Cancel claims 23-25.

26. (New) The material separation screen according to claim 21 including a divider extending inside the vacuum tube that forms a first chamber that maintains a rigid constant alignment with the first set of holes and forms a second chamber that maintains a rigid constant alignment with the second set of holes while the materials are carried over the material separation screen.

27. (New) A material separation screen, comprising:
a first separation screen stage of multiple shafts aligned along a separation screen frame and configured to rotate in a direction causing paper products to move along the separation screen, the shafts configured with a shape and spacing so that substantially rigid pieces of the paper products move along the screen while substantially non-rigid pieces of the paper products slide down between adjacent shafts, wherein at least some of the multiple shafts are covered with a roughtop conveyer belting.

28. (New) The material separation screen according to claim 27 including a vacuum and a second separation screen stage of one or more vacuum shafts, the vacuum sucking air through air input holes in the vacuum shafts for retaining the substantially non-rigid pieces of the paper products against the vacuum shafts and pulling the non-rigid pieces of the paper products down between the adjacent shafts.

29. (New) The material separation screen according to claim 28 wherein the vacuum shafts include a set of air output holes, the vacuum blowing air out through the air output holes for dislodging the non-rigid pieces of the paper products retained against the vacuum shaft and pushing the non-rigid pieces of the paper products down between the adjacent shafts.

30. (New) The material separation screen according to claim 28 wherein the vacuum shafts are covered with a roughtop conveyer belting.

31. (New) The material separation screen according to claim 28 further comprising a third separation screen stage in front of the first and second separation screen stages comprising discs located on shafts in front of the vacuum shaft for moving the paper products along the separation screen.

32. (New) The material separation screen according to claim 31 wherein the discs have multiple sides that maintain a substantially constant spacing with discs on adjacent shafts.

33. (New) The material separation screen according to claim 31 wherein at least some of the discs are dual diameter discs having a primary disc with a first outside perimeter and a secondary disc with a second outside perimeter smaller than the first outside perimeter.

34. (New) The material separation screen according to claim 31 wherein the first, second and third separation screen stages are all aligned along a same plane.